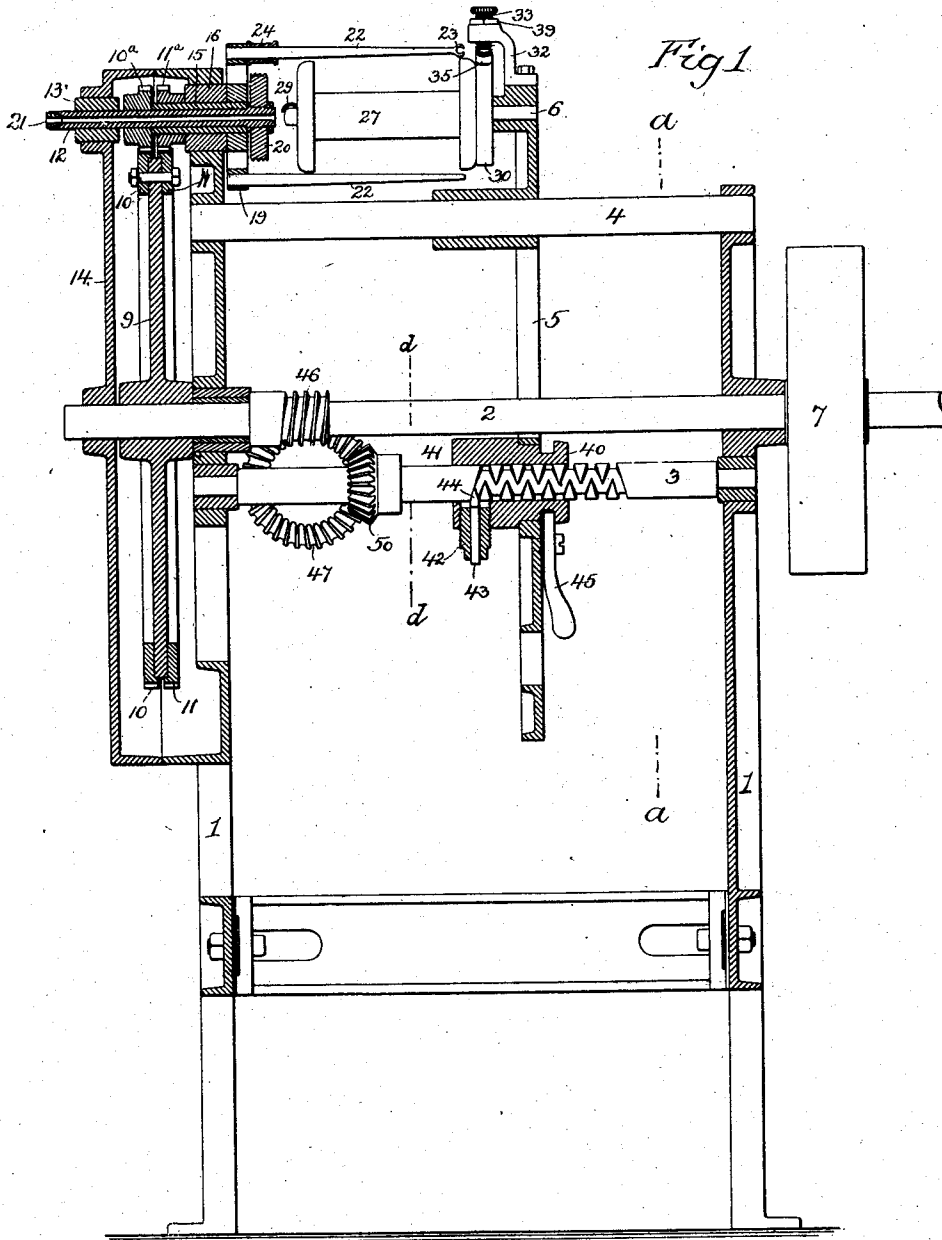


R. DAWES.
SPINNING OR TWISTING AND WINDING MACHINE.
APPLICATION FILED MAY 24, 1910.

994,576.

Patented June 6, 1911.

3 SHEETS—SHEET 1.



Witnesses
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Kate A. Biddle

Inventor
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by his attorneys
Smith & Jones

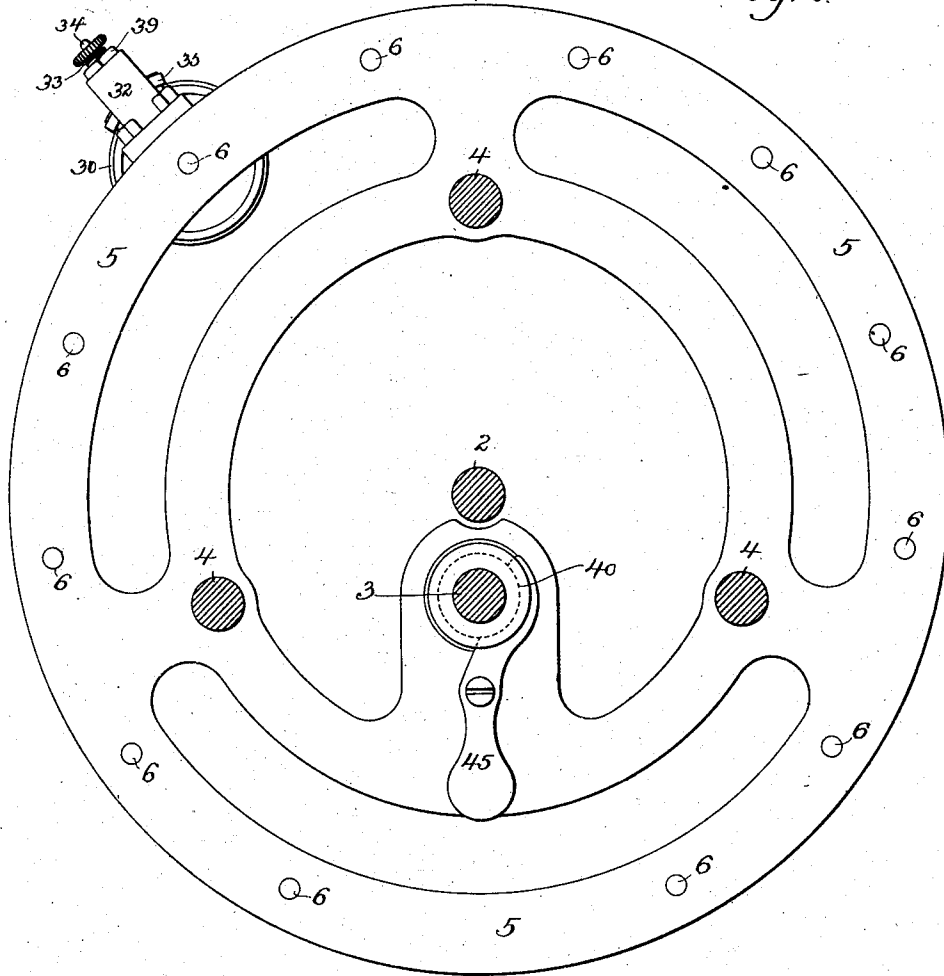
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3 SHEETS-SHEET 2.

Fig. 2.



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3 SHEETS-SHEET 3.

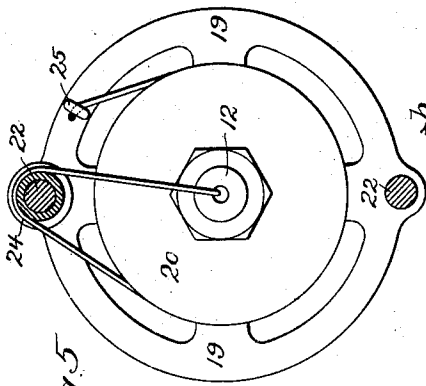


Fig. 5.

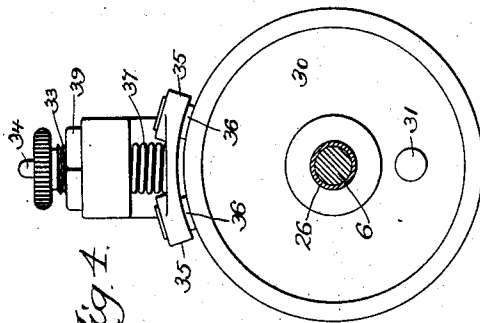


Fig. 4.

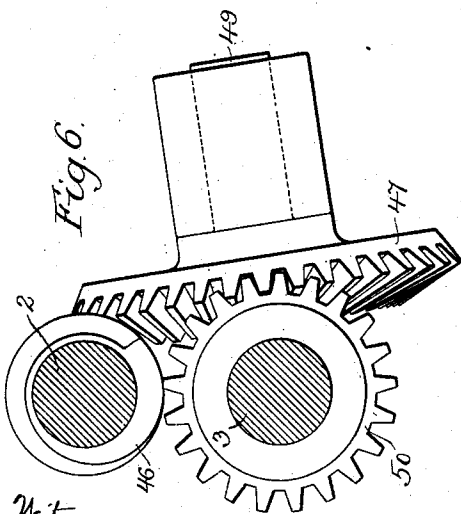


Fig. 6.

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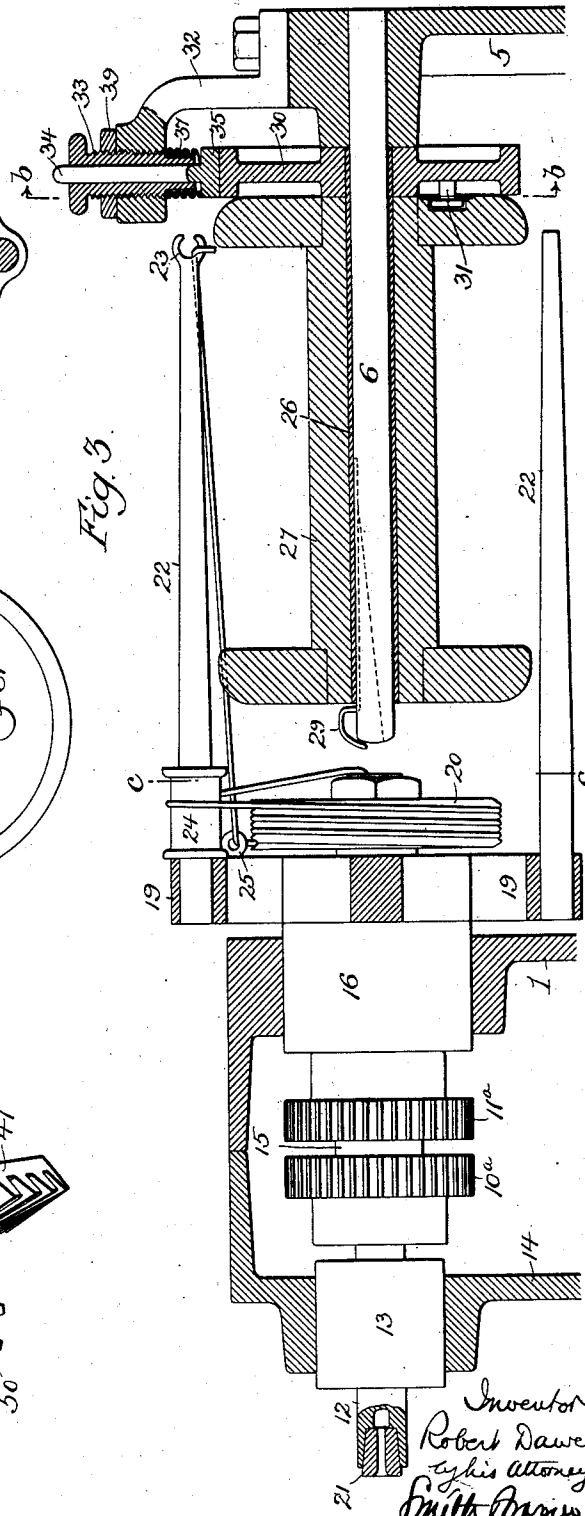


Fig. 3.

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UNITED STATES PATENT OFFICE.

ROBERT DAWES, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF TWO-THIRDS TO EDMUND DAWES, OF PHILADELPHIA, PENNSYLVANIA, AND EDWARD H. HASKELL, OF BOSTON, MASSACHUSETTS.

SPINNING OR TWISTING AND WINDING MACHINE.

994,576.

Specification of Letters Patent.

Patented June 6, 1911.

Application filed May 24, 1910. Serial No. 563,180.

To all whom it may concern:

Be it known that I, ROBERT DAWES, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Spinning or Twisting and Winding Machines, of which the following is a specification.

My invention relates to that type of machine in which a strand or roving is spun, or a plurality of strands are twisted together, the spun or twisted thread being then wound upon a spool or bobbin, the machine usually comprising a number of spinning or twisting devices driven from a common shaft.

For convenience, I will, in this specification, assume that the machine is one intended for spinning single strands or rovings although it is equally applicable for twisting together a plurality of strands, if desired.

The objects of my invention are to simplify the mechanism for imparting draft to the strand; to effect the smoothing or rounding up of the strand prior to the spinning of the same; to regulate the tension under which the spun thread is wound upon the spool or bobbin (hereinafter termed a "spool") and to readily release the spool carrying frame from the screw whereby movement is normally imparted to said frame for the purpose of laying the threads from end to end of the spools, thereby permitting the spools to be readily applied to or doffed from their spindles.

These objects I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a central, vertical, longitudinal section of a spinning or twisting machine constructed in accordance with my invention but illustrating only one spool and the spinning and winding appurtenances employed in connection therewith; Fig. 2 is a transverse section on the line *a—*a**, Fig. 1; Fig. 3 is a view partly in side elevation and partly in longitudinal section, of one of the spinning and winding devices; Fig. 4 is a transverse section on the line *b—*b**, Fig. 3; Fig. 5 is a transverse section on the line *c—*c**, Fig. 3, and Fig. 6 is a transverse section on the line *d—*d**, Fig. 1. Fig. 2 is on a larger scale than Fig. 1, and Figs. 3 to 6, inclusive, are on a still larger scale.

In Fig. 1 of the drawing, 1, 1 represent

the fixed end frames of the machine which are provided with bearings for the main driving shaft 2 and for the traverse screw 3, these frames also carrying rods 4 upon which is mounted, so as to be free to slide longitudinally, the frame 5 which carries the spindles 6 for the spools upon which the threads are wound, there being as many of these spindles as the size of the machine will permit, the frame shown in Fig. 2 carrying twelve of these spindles, but illustrating the brake mechanism for but one of the spools.

Power is applied to the driving shaft 2 by means of a belt pulley 7 or in any other desirable way, and said shaft carries a wheel 9 which has mounted upon it two spur-toothed rims 10 and 11, or two toothed wheels may be employed, the single wheel with the two rims being preferred, however, in order to cheapen repairs in case the teeth of either rim become broken or defective from any cause.

The toothed rim 10 meshes with spur pinions 10^a on tubular shafts 12 of which there are as many as there are spindles 6, the axis of each tubular shaft 12 being coincident with that of the corresponding spindle. Each tubular shaft 12 has its outer bearing in a block 13 mounted in a gear-inclosing hood 14 which is secured to one of the end frames 1, the shaft having its inner bearing in a tubular shaft 15 which turns in a bearing block 16 carried by said frame 1.

The toothed rim 11 meshes with a spur wheel 11^a on the outer end of the tubular shaft 15, and on the inner end of said shaft is the flier 19. The inner end of the tubular shaft 12 carries a peripherally grooved draft drum 20, and the outer end of said shaft has an eye 21 inserted therein.

From the flier 19 project two arms 22 which are diametrically opposite one another for balancing purposes, each of these arms having at its outer end a guide eye 23 and on one of said arms is mounted so as to be free to rotate, a sheave or pulley 24 adjacent to which is a guide eye 25 fixedly mounted on the flier.

Free to turn on each of the spindles 6 is a sleeve 26 upon which is mounted the spool 27, the latter being retained in longitudinal position upon the sleeve 26 by means of a spring clip 29 or other suitable device at the

outer end of the spindle 6. Secured to the sleeve 26 is a drum 30 which is so connected to the head of the spool 27 as to cause rotative movement of the drum with the spool, the means adopted in the present instance for effecting such connection being a projecting pin 31 on the drum which enters an opening in the head of the spool, said pin having the usual head and the opening being undercut so as to confine the spool longitudinally to the drum in the usual manner.

The frame 5 is intended to carry, adjacent to each spindle 6, a bracket 32, whose outer portion overlaps the drum 30 and carries an adjustable screw plug 33, within which is free to slide radially the stem 34 of a brake head 35, the latter carrying a series of plugs 36 of cork, leather, raw hide, or other suitable friction material, cork being preferred, as it has been found in practice to give the best results. Between the back of this brake head 35 and a shouldered portion of the screw plug 33 is interposed a coiled spring 37 the tension of which can be readily regulated by turning said screw plug in one direction or the other, the plug, after the desired adjustment has been effected, being locked in position by means of a lock nut 39.

Mounted in an opening in the frame 5 is the grooved hub 40 of a block 41, the latter having an opening for the reception of a screw plug 42 in which is mounted the stem 43 of a swinging blade 44, the latter engaging with a reversely cut screw thread on the traverse screw 3, whereby, as the latter is rotated, the blade 44 will be caused to traverse from end to end of the thread and will be automatically reversed at each end of its travel, thereby imparting longitudinal reciprocating movement to the block 41 and to the spool-carrying frame 5.

Pivotaly mounted upon the frame 5 is a lever 45, one arm of which engages the grooved hub 40 and thereby serves to lock the same to the frame 5, release of said hub from the frame being effected by proper manipulation of the lever 45.

The traverse screw 3 is rotated at a lesser speed than the driving shaft 2 by means of the gearing shown in Fig. 1, this gearing comprising a worm 46 on the shaft 2 meshing with a combined worm and bevel wheel 47 on a short transverse shaft 49, the bevel teeth of said composite wheel meshing with a bevel wheel 50 on the shaft 3.

Both the flier and the grooved draft drum 20 rotate in the same direction, but the spur pinion 10^a has a lesser number of teeth than the spur pinion 11^a, consequently for every complete rotation of the flier 19 the drum 20 will have a movement in excess of a complete rotation, depending upon the difference in the number of teeth in the two pinions, or the same result may be effected

by providing the pinions 10^a and 11^a with the same number of teeth and providing the toothed rim 10 with a greater number of teeth than the toothed rim 11.

The strand to be spun into a thread is passed through the eye 21 at the outer end of the tubular shaft 12 and is thereby rounded, condensed and smoothed prior to being spun, the strand passing from the inner end of the tubular shaft 12, thence around the pulley or sheave 24, thence one or more times around the grooved drum 20, thence through the eye 25, thence to the eye 23 at the outer end of the corresponding arm 22, and thence to the spool.

The spool is caused to rotate by the pull of the thread thereon, such rotation being, however, retarded by the action of the brake shoe upon the drum 30, the force with which said shoe is caused to press upon the drum determining the tension upon the thread as it is wound upon the spool and consequently the slackness or tightness of the wind. The speed of rotation of the draft drum 20 in respect to the speed of rotation of the flier determines the amount of draft upon the strand and consequently the degree of twist imparted thereto, this result being attained with the use of but a single draft drum instead of the plurality of geared drums generally employed for the purpose.

The rate of draft of the drum in proportion to the speed of rotation of the flier and consequently the number of turns to the inch imparted to the strand can be varied without change of the gearing by simply substituting for one draft drum, another of larger or smaller diameter.

When it is desired to apply or doff the spools 27, the frame 5 is released from the hub of the block 41, and can then be moved longitudinally to such an extent as to permit of the application of the spools to or their removal from the spindles 6.

I claim:

1. A spinning or twisting machine in which are combined a flier, a single draft drum rotating about the same axis as the flier, a hollow shaft for said drum through which the strand is fed, and a guide on the flier over which the strand passes in its course from the hollow shaft to the periphery of the drum.

2. A spinning or twisting machine in which are combined a flier, a single draft drum rotating about the same axis as the flier, a hollow shaft for said drum through which the strand is fed, a guide on the flier over which the strand passes in its course from the hollow shaft to the periphery of the drum, and a second guide on the flier through which the strand passes upon leaving the drum.

3. A spinning or twisting machine in which are combined a flier; and draft mech-

anism, the latter having a rotating hollow shaft through which the strand passes, and said shaft having an eye at its entrance end for rounding and condensing the incoming strand.

4. A spinning or twisting machine in which are combined a flier, a single draft drum rotating about the same axis as the flier, a guide over which the incoming strand passes on its way to the drum, means for imparting like rotations to said flier and guide, and means for imparting to the draft drum a greater number of rotations in a given time than are imparted to the flier and guide.

5. A spinning or twisting machine in which are combined a flier, a single draft drum rotating about the same axis as the flier, a tubular flier shaft, a tubular drum shaft turning in said flier shaft, and means for rotating said drum shaft at a higher rate of speed than the flier shaft.

6. A spinning or twisting machine in which are combined a flier, a single draft drum rotating about the same axis as the flier, shafts for said flier and drum, pinions on said shafts, and a wheel having toothed rims, one engaging with one of said pinions and the other with the other pinion.

7. A spinning or twisting machine in which are combined a flier, a spool, a drum connected to and rotating with said spool, and a friction shoe having plugs of cork for bearing upon the drum.

8. A spinning or twisting machine in

which are combined a flier, a spool, a drum connected to the spool so as to rotate with the same, a brake shoe for acting on said drum, a spring acting to press said shoe toward the drum, and an adjustable plug acting upon said spring to regulate the tension of the same, said plug also constituting a guide for the stem of the brake shoe.

9. A spinning or twisting machine in which are combined a traverse screw, means for rotating the same, a block having a member engaging said screw, a spool-carrying frame movable longitudinally into and out of engagement with said block, and means independent of its screw-engaging member for confining the block to or releasing it from the spool-carrying frame.

10. A spinning or twisting machine in which are combined a traverse screw, means for rotating the same, a block having a grooved hub, and a member engaging the traverse screw, a spool-carrying frame fitted upon the block adjacent to the groove, therein, but movable longitudinally into and out of engagement with the block, and a lever pivoted upon the spool-carrying frame and movable into and out of the groove in the hub of the block.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

ROBERT DAWES.

Witnesses:

KATE A. BEADLE,
HAMILTON D. TURNER.